

L 61695-68 EWT(m) Pab DIAAP
ACCESSION NR: AP5019462

UR/0089/64/017/004/0313/0314

AUTHOR: Frolov, V. V.

TITLE: Scientific Conference of MIFI (Moscow Engineering Physics Institute)

SOURCE: Atomnaya energiya, v. 17, no. 4, 1964, 313-314

TOPIC TAGS: nuclear physics conference

ABSTRACT: ¹⁹ About 250 papers were presented at the annual scientific conference of the MIFI, held in May 1964. Among papers of interest to nuclear scientists were those in the experimental nuclear physics section chiefly devoted to the study of particles; theoretical nuclear physics section (papers on "Moving branching points on a j-plane and their role in the asymptote of strong reactions at great energies"; "On the probability of β -decay of nuclei"; "On spontaneous fissioning of nuclei"); two sections on experimental physics, including papers on neutron transfer equations and water-boiling processes at reduced pressures; a section on isotopes and the physics of nuclear radiations in which the following subjects were treated: development of radioisotope methods for studying

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properties of substances in industrial application; radioactive isotope and nuclear radiation analysis methods; study of the effects of nuclear radiation on solids. Papers on dosimetry and safety and on strength physics (materials engineering) were presented in sections devoted to these subjects. The electrophysical section heard papers on theoretical

work on linear accelerators and high-energy particle separators; experimental work in the development of linear accelerators and particle separators; and works on physical electronics. Many students were among those presenting papers.

ASSOCIATION: none

SUBMITTED: 00

NR REF SOV: 000

Card 2/2 *llc*

ENCL: 00

OTHER: 000

SUB CODE: NP

JPRS

L 27599-66 ENT(m) IJP(c)

ACC NR: AP6018399

SOURCE CODE: UR/0089/65/019/007/0314/0316

AUTHOR: Frolov, V. V.

ORG: none

TITLE: Scientific conference of MIFI (Moscow Engineering and Physics Institute)

SOURCE: Atomnaya energiya, v. 19, no. 3, 1965, 314-316

TOPIC TAGS: muon hydraulic resistance, mass spectrometry, linear accelerator, electron accelerator, ion beam, laser beam, physics conference, erosion, gas discharge, nuclear reactor

ABSTRACT: The annual MIFI scientific conference hear 210 reports in 53 sessions of 22 sections when the 2000 participants met 5-21 May 1965. Among the most interesting reports and subjects discussed were: the energy spectra of cosmic muons at great zenith distances in the 10^{11} - 10^{12} ev energy range; the construction of a strictly phenomenological approach to the theory of the nucleus and the problem of many bodies; new synthetic methods of calculation of distribution of neutron fields in reactors; hydraulic resistance and heat exchange upon longitudinal flow around a group of rods; the study of molecular processes with mass spectrometry; the influence of electric fields on photographic emulsion density; the influence of inhomogeneities in shielding on its effectiveness; theoretical and experimental studies of linear electron accelerators; the effect of erosion

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processes on metal surfaces in gas discharges at low pressure under the influence of ion and laser beams; binary injections in p-i-n silicon structures; and many others, not described in this report, in the sections on automatics and telemechanics, electronics, plasma physics, cybernetics, instrument building and design, strength physics and others. /JPRS/

SUB CODE: 20, 18 / SUBM DATE: none

Card 2/2 CV

ACC NR: AP8032409

SOURCE CODE: UR/0089/66/021/003/0220/0222

AUTHOR: Frolov, V. V.

ORG: none

TITLE: MIFI Scientific conference

SOURCE: Atomnaya energiya, v. 21, no. 3, 1966, 220-222

TOPIC TAGS: physics conference, high energy particle, meson, hyperon, neutron distribution, plastic deformation, electron flux, neutron diffusion, eigenvalue, metal zone melting

ABSTRACT:

The twenty-third annual scientific conference of the Moscow Engineering Physics Institute (MIFI) was held from 5 to 20 May 1966. Approximately 900 participants from various scientific-research institutes, universities, and factories heard about 300 reports by the instructors and students of the Institute and also by colleagues from other scientific institutions.

Several highly interesting papers were presented on the physics of high-energy particles. In particular, V. V. Borog and his co-

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workers reported on experiments on electron-photon cascades produced in iron by muon cosmic rays with energies of $8 \cdot 10^{11}$ ev performed with an ionization calorimeter. The results were compared with theoretical cascade curves for various values of radiation units with the best agreement obtained when the radiation unit $t = 14 \text{ g/cm}^2$.

V. S. Demidov and others reported on the pair production of strange particles in research conducted with the 105-cm MIFI propane-freon bubble chamber. The mass spectrum was obtained in the $K^0 \lambda^0$ -system. Demidov and his colleagues also studied the production of K^0 -mesons and λ -hyperons on hydrogen and light nuclei by 4 Bev/c π^- -mesons. The energy and momentum distributions of the K^0 -mesons and the λ -hyperons were also determined.

Of paramount interest in the field of reactors were the reports delivered by V. V. Khromov, I. S. Slesarev, A. M. Kuz'min, and others devoted to numerical methods of calculating reactors. Precise ways of determining a neutron field, and also effective methods of finding the criticality conditions and neutron distribution in multi-dimensional geometries were presented. The algorithms proposed

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significantly shorten computer operation time and are particularly useful in variational calculations.

In reports on reactor theory, S. B. Shikhov, L. K. Shishkov, and others presented proof for the existence and uniqueness of the solution of neutron transport equations and of problems of nonlinear reactor dynamics (self-oscillating regimes). Shishkov and Shikhov also collaborated on a paper dealing with a theory of higher order perturbations for solving certain reactor calculation problems. It was reported that the variation of the neutron transport operator eigenvalue and its eigenfunction (neutron flux) can be obtained without a complete set of eigenfunctions. Even in the first approximation this method permits a more exact calculation of K_{eff} than with the generally accepted perturbation theory.

In the area of the physics of shielding, I. E. Konstantinov and B. Ya. Narkevich reported the development of a new method of measuring spatial distribution of doses and fluxes of electrons during the passage of a thin beam of β -particles through a light material using a scintillation spectrometer. This method, based on the

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use of thin scintillating films and the designed detector, makes possible measurements without addition of perturbations to the investigated object. The absorbed dose is determined exactly both within and outside the beam.

A report on experimental research conducted by S. B. Stepanov and his colleagues on the diffusion parameters of hydrogenous media evoked great interest among the conferees. In this work, the interrelationship between the neutron diffusion coefficient and the self-diffusion coefficient of the medium was determined.

V. I. Deyev and G. P. Dubrovskiy reviewed the results of their experimental research on heat transfer and critical heat loads in volume boiling of water under a vacuum. It was shown that the boiling of water and liquid metals under low pressures is similar.

L. S. Kokorev and others described a new method of determining the contact angle in liquid metal wetting by measuring the maximum temperature in a gas bubble. New data was presented on the angle of contact for sodium and potassium.

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Growing of molybdenum monocrystals by the zone melting method was described by Ye. M. Savitskiy and G. I. Burkhanov. A. A. Rusakov and others studied the fine structure of molybdenum monocrystals grown by precipitation from the gas phase. A. I. Yevstyukhin and his colleagues reported on the peculiarities of plastic deformations of molybdenum monocrystals during rolling and tension, and N. F. Litvinova reported on methods of determining the gas content in pure molybdenum.

In a series of papers, P. L. Gruzin, L. A. Alekseyev, G. N. Shlokov, and others presented the results of investigations of properties of solids by the Mössbauer method. Of particular note was a report on research conducted on the properties of stanniferous ferrites of the magnesium-manganese system for which the intrinsic effective magnetic fields of the Sn^{119} nuclei and their temperature variations were determined from the Zeeman patterns. The practical uses of the Mössbauer method for solving technological problems in obtaining ferrites with the necessary magnetic properties were also discussed.

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Most of the reports will be published in the regular MIFI
collections of scientific articles. [FSB: v. 2, no. 11/

SUB CODE: 20,18 / SUBM DATE: none

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ACC NR: AM6032824

(A)

Monograph

UR/

Dubovskiy, B. G.; Kamayev, A. V.; Kuznetsov, P. M.; Vladikov, G. M.; Gurin, V. N.; Murashov, A. P.; Markelov, I. P.; Kochergin, V. P.; Vaymugin, A. A.; Sviridenko, V. Ya.; Diyev, L.V.; Bogatyrev, V.K.; Vavilov, V. V.; Frolov, V. V.

Critical parameters of systems with fissionable materials and nuclear safety; a handbook (Kriticheskiye parametry sistem s delyashchimiya veshchestvami i yadernaya bezopasnost'; spravochnik) Moscow. Atomizdat. 1966. 225 p. biblio., diagrs., tables. 9000 copies printed.

TOPIC TAGS: nuclear safety, nuclear reactor, homogeneous nuclear reactor, heterogeneous nuclear reactor, chain reaction

PURPOSE AND COVERAGE: This handbook is intended for specialists concerned with the problems of assuring nuclear safety as well as for persons calculating, designing, operating, and studying the physics of nuclear reactors of various types, as well as for students in associated departments. The book discusses methods of creating and maintaining conditions which will exclude the possibility of an accidentally chain reaction during the processing, storage, and transportation of fissionable materials. The book is based mainly on the results of studies published before 1965. In addition to information on critical parameters of systems with fissionable materials, the authors considered it useful to include in the handbook the fundamental concepts of criticality, principles for assuring nuclear safety, a review of cases of the occurrence of uncontrolled chain reactions,

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UDC: 621.039.519.4/621.039.58

ACC NR: AM6052824

and the basic standards for nuclear safety. The authors express appreciation to M. P. Rodionov, T. I. Sukhovikhova, M. A. Gavrilova, and L. V. Antonkina for their valuable assistance. There are 64 references, 30 of which are Soviet.

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SUB CODE: 18/

SUBM DATE: 20 May 66/

ORIG REF: 030/

OTH REF: 034

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FROLOV, V.V. (Moskva)

Optimal system of radiating fins. Izv. AN SSSR Enerp. 1 transp.
6:750-755 N-D '64. (MIRA 18:3)

L 32031-66 EWT(m)/EWP(v)/T/EWP(t)/ETI/EWP(k) IJP(c) JD/WM/HM/JG
 ACC NR: AP6019426 (N) SOURCE CODE: UR/0135/66/000/006/0007/0010

AUTHOR: Frolov, V. V. (Doctor of technical sciences); Gorshkov, A. I. (Candidate of technical sciences)

ORG: none

TITLE: Effect of hydrogen on the formation of porosity during argon-shielded arc welding of titanium

SOURCE: Svarochnoye proizvodstvo, no. 6, 1966, 7-10

TOPIC TAGS: titanium alloy, titanium alloy welding, argon shielded welding, alloy weld, weld porosity, hydrogen porosity, arc welding/VT1-2 alloy, VT14 alloy, VT15 alloy

ABSTRACT: The relationship between porosity formation and hydrogen diffusion in titanium alloy welds has been investigated. VT1-2, VT14, and VT15 alloy sheets 2.5, 3.0, and 1.2 mm thick were welded under the following respective conditions: current 165, 250 and 110 a, arc voltage 10, 11 and 8 v, and welding speed 0.4, 0.4 and 0.7 cm/sec. The experiments showed that the maximum desorption of hydrogen occurred in the front part of the melting pool. Desorption of hydrogen prevailed upon diffusion at all concentrations of hydrogen in titanium. Diffusion of hydrogen depends on the heat input: an increase of heat input from 300 to 900 kg·cal/cm increased the volume of diffused hydrogen from $2.1 \cdot 10^{-4}$ to $16 \cdot 10^{-4}$ cm³ and the weld porosity about 8 times.

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ACC NR: AP6019426

10 /
Time that the metal remains in the liquid state greatly affects the amounts of diffused and desorpted hydrogen and the porosity in the weld; all three decrease if metal remains for a prolonged period of time in the liquid state, i.e., with increasing heat input. There is, however, a critical value of heat input. An increase of heat input to the values below the critical increases the amount of porosity. Only after the critical value has been exceeded does the amount of porosity drop with a further increase of heat input. Orig. art. has: 8 figures and 4 tables. [AZ]

SUB CODE: 11, 13/ SUBM DATE: none/ ORIG REF: 009/ ATD PRESS: 5017

Card

2/2

FROLOV, V.Ya. (Leningrad)

... Spring snow. Priroda 52 no.3:127 '63.
(Kursk Province—Snow)

(MIRA 16:14)

FROLOV, Viktor Yakovlevich, tokar'; CHERNOV, Ye., red.; LIL'YE, A., tekhn.
red.

[Everyone can have skilful hands] Umelye ruki mogut byt' u kazhdogo.
[Moskva] Moskovskii rabochii, 1957. 46 p. (MIRA 11:5)

1. Moskovskiy zavod kontrol'no-izmeritel'nykh priborov (for Frolov)
(Technical education)

FROLOV, V.Ya.

On the necessity of clarifying some regulations of the Operating
Rules. Zhel.dor.transp. 39 no.7:61-64 J1 '57. (MLRA 10:8)

1.Zamestitel' nachal'nika tekhnicheskogo otdela Upravleniya
Oktyabr'skoy dorogi.
(Railroads--Management)

FROLOV, V.Ya.

Design and operation problems of ponds and small reservoirs.
Trudy Lab. ozeroved. 7:148-151 '58.

(MIRA 11:10)

1. laboratoriya ozerovedeniya AN SSSR.
(Farm ponds) (Reservoirs)

FROLOV, V. Ya.

Profile grinding at the Gorkiy Automobile Plant. Biul.tekh.-ekon.
inform. no.3:32-34 '61. (MIRA 14:3)
(Grinding and polishing)

EROLOV, V.M.

Development of erosion produced by water in Kursk and Voronezh
provinces. Trudy Lab. ozeroved. 13:185-221 '61.

(MIRA 14:10)

(Kursk Province--Erosion)

(Voronezh Province--Erosion)

(Reservoir sedimentation)

FROLOV, V.Ya.

Slope asymmetry of the gully and ravine network of Kursk Province
and the role of firms in their formation. Izv. AN SSSR. Ser. geog.
no.3:59-63 '64. (MIRA 17:6)

1. Laboratoriya ozerovedeniya AN SSSR.

Frolov, V. E.

USSR/ Miscellaneous - Ceramics manufacture

Card 1/1 Pub. 123 - 7/16

Authors : Nagornyy, A. I.; Frolov, V. E.; Lebedev, M. A.; Khokhol'kova, L. A.;
and Mikhoylyants, O. A.

Title : Manufacture of ceramic sewer pipes from Lengersk infusible clay

Periodical : Vest. AN Kaz. SSR 12, 63-67, Dec 1954

Abstract : The possibility of manufacturing high-quality ceramic sewer pipes
from infusible Lengersk clays are discussed. The technological
process employed in the manufacture of refractory tubes is
described. Two USSR references (1941 and 1952). Tables.

Institution :

Submitted : M. I. Goryaev, Active Member of Acad. of Sc. Kaz-SSR

BRAGINSKIY, K.I.; FROLOV, Ya.A.

Mathematical analysis of the behavior of glass during molding.

Stek. i ker. 18 no.10:22-26 0 '(1.

(MIRA 14:11)

(Glass manufacture)

GUR'YANOVA, M.F.; FROLOV, Ya.A.

"Granulating" a glass batch with large-grained sand. Stek. i ker.
18 no.10:26-27 0 '61. (MIRA 14:11)
(Glass manufacture)

AKRIDIN, A., inzh.; FROLOV, Ye., inzh.

Two-cantilever roof panels measuring 3x12 made of keramzit concrete.
Na stroi.Ros. 3 no.6:27-28 Je '62. (MIRA 16:7)
(Keramzit) (Roofing, Concrete)

FROLOV, Ye.V.

VASSOYEVICH, N.B., prof., doktor geol.-miner.nauk; ANDREYEV, P.F., kand.
khim.nauk; BELYAKOV, M.F., kand.geol.-miner.nauk; BARANOVA, T.E.,
nauchnyy sotrudnik; BUSHINSKIY, G.I., prof.; GEEKER, R.F., prof.,
doktor biolog.nauk; GROSSGETM, V.A., kand.geol.-miner.nauk;
ITENBERG, S.S., dotsent; KRISHTOFOVICH, A.N.; LYUBOMIROV, B.N.,
kand.geol.-miner.nauk; PORFIR'YEV, G.S., kand.geol.-miner.nauk;
POKROVSKAYA, I.M., prof., doktor geol.-miner.nauk; RADCHENKO, O.A.,
kand.khim.nauk; RUKHIN, L.B., prof., doktor geol.-miner.nauk;
TORGOVANOV, V.B., gidrogeolog; USPENSKIY, V.A., kand.khim.nauk;
FROLOV, Ye.V., kand.geol.-miner.nauk; FURSENKO, A.V.; KHAIN, V.Ye.,
prof., doktor geol.-miner.nauk; SHARONOV, V.V., prof., doktor
fiziko-matem.nauk; YASHCHURZHINSKAYA, A.B., vedushchiy red.;
SOKOLOVA, Ye.V., tekhn.red.

(Continued on next card)

VASSOYEVICH, N.B.---(continued) Card 2.

[Handbook for field geologists and petroleum prospectors]
Sputnik polevogo geologa - neftianika. Leningrad, Gos.nauchno-
tekhn.izd-vo neft. i gorno-toplivnoi lit-ry, Leningr.otd-nie,
1952. 504 p.
(MIRA 12:12)

1. Groznenskiy ordena Trudovogo Krasnogo Znameni neftyanoy insti-
tut (for Itenberg). 2. Daystvitel'nyy chlen AN Ukrainskoy SSR
(for Krishtofovich). 3. Chlen-korrespondent AN Belorusskoy SSR
(for Fursenko).

(Petroleum geology--Handbooks, manuals, etc.)

FROLOV, Nikolay Fedorovich; FROLOV, Yevgeniy Fedorovich; PERSHINA, E.G.,
vedushchiy redaktor; SHKIN, S.F., tekhnicheskii redaktor;

[Geological observations and structures during the drilling of
deflected wells) Geologicheskie nabludeniia i postroeniia pri
burenii iskrivlennykh skvazhin, Moskva, Gos.nauchno-tekhn.izd-
vo neft. i gorno-toplivnoi lit-ry, 1957. 183 p. (MLBA 10:4)
(Oil well drilling)

BROD, Ignatij Osipovich; PROLOV, Yevgeniy Fedorovich; YERSHOV, P.R.,
vedushchiy redaktor; TROPIMOV, A.V., tekhnicheskii redaktor

[Search and exploration for oil and gas deposits] Poiski i razvedka
neftianyykh i gazovykh mestorozhdenii. Izd. 2-oe, perer. i dop.
Moskva, Gos. nauchno-tekhn. izd-vo neftianoi i gorno-toplivnoi lit-
ry, 1957. 674 p. (MIRA 10:1)

(Petroleum) (Gas, Natural) (Prospecting)

1 KOLLOV, 1957
SIVOKHINA, N.B.; FROLOV, Ye.F.

Determining the accuracy of well surveying measurements and calculating errors. Trudy VNI no.11:321-339 '57. (MIRA 10/11)
(Oil wells--Measurement)

FRULOV, Ye. F.
FROLOV, Ye. F.; SERGANOVA, I. I.

Effect of well surveying errors on the accuracy of platform upland
structural maps. Trudy VNI no. 11: 340-346: 57. (MLBA 10:11)
(Geology--Maps)

Frolov, Ye. F.
FROLOV, Ye. F.; SERGANOVA, I. I.

Projecting deflected well logs on a profile section. Trudy VII no. 11:
347-354 '57. (MLRA 10:11)
(Prospecting--Geophysical methods) (Geology, Stratigraphic)

СУХОВИНА, Н.З.; СКОЛОВ, Я.Ф.; ОП. НАУЧ. ЦЕН. А.Н.С.

Formulas for calculation of stress in determining the position of wall bottoms and total deflection at the expense of wall deflection.
Trudy VNIi no.11:277-283, 1977. (MIR: 12:7)

(Petroleum engineering)

VASIL'YEV, Yu.S.; SIVOKHINA, N.B.; FROLOV, Ye.F.; CHERNOGLAZOVA, T.Ya.

Permissible deflections of bottom holes from the planned
position; a topic for discussion. Neft. khoz. 39 no.4:14-20
Ap '61. (MIRA 14:6)

(Oil well drilling)

FROLOV, Ye.F.

Basic surveying problems in oil and gas production. Trudy VNII
no.36:3-12 '62. (MIRA 15:11)
(Gas, Natural—Geology) (Petroleum geology)

FROLOV, Ye.F.

Results of preliminary studies of the accuracy of calculating
petroleum reserves. Trudy VNII no.36:154-166 '62. (MIRA 15:11)
(Petroleum geology)

SIVOKHINA, N.B.; FROLOV, Ye.F.; CHERNOGLAZOVA, T.Ya.

Intersecting of the shafts of deflected wells. Trudy VNII no.36:
13-18 '62. (MIRA 15:11)

(Oil well drilling)

FROLOV, Ye.F.; SIVOKHINA, N.B.; DEMENT'YEV, L.F.; KOCHETOV, M.N.; MOLOTOV,
N.A.

Preliminary method of evaluating the accuracy of calculating
petroleum reserves by the volume method. Trudy VNII no.36:38-56
'62. (MIRA 15:11)

(Petroleum geology)

PROLOV, Ye.I.

Rare case of perforation of the intestinal wall by foreign bodies
with the formation of an arteriovenous aneurysm. Khirurgiia 38
no.10:124-125 0 '62. (MIRA 15:12)

1. Iz gosspital'noy khirurgicheskoy kliniki (i. o. zav. kafedroy -
dotsent G.N. Zakharova) Saratovskogo meditsinskogo instituta.
(ABDOMINAL ANEURYSM) (INTESTINES—FOREIGN BODIES)

PERESLEGIN, Viktor Ignat'yevich; FROLOV, Ye. P., otv. red.; MEDVEDEVA, R.,
red. izd-va; TELEGINA, T., tekhn. red.

[Regime of economy during the period of the building of communism] Rezhim ekonomii v period stroitel'stva kommunizma.
Moskva, Gosfinizdat, 1962. 86 p. (MIRA 16:2)
(Industrial management)

Frolov, Ye. P.

PHASE I BOOK EXPLOITATION

305

Ganshtak, Vladimir Iosifovich

Ocherki po ekonomike mashinostroitel'noy promyshlennosti SSSR
(Essays on the Economics of the Machine-building Industry
of the USSR) Simferopl', Mashgiz, 1957. 418 p. 6,000
copies printed.

Ed.: Frolov, Ye. P.; Ed. of Publishing House: Bogolyubova, I.Yu.
(Deceased); Tech. Ed.: El'kind, V.D.

PURPOSE: The book is intended for a wide circle of engineers,
technical personnel, and economists in the machine-building
industry, and also for scientific workers and students in
institutions of higher learning.

COVERAGE: The book discusses the following basic problems of
the economics of the USSR's machine-building industry: the
development of machine building as a leading branch of industry;
technical developments in machine building; concentration,
specialization, cooperation, and combination in the machine-
building industry; principal and turnover funds; personnel,

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Essays on the Economics of the Machine-building Industry (Cont.) 305

cadres, labor productivity, and wages; cost of production and profitableness in machine building. The book also indicates ways and means for greater utilization of resources in the further growth and improvement of production. According to the foreword, this is a first attempt to consider the principal questions of economics of machine building on the basis of their connections and interrelations. The text is abundantly illustrated with statistical data and examples. There are 250 Soviet references.

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AVAILABLE: Library of Congress

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TROITSKIY, Petr Aleksandrovich; STUCHEVSKIY, Mark Pavlovich; NBYMAN, Z.N.,
inzh., retsenzent; PROLOV, Ya.P., inzh., retsenzent; BOGINSKIY,
M.N., inzh.-ekon., red.; TKACHUN, A.I., red.izd-va; EL'KIND, V.D.,
tekhn.red.

[Cost planning for machinery manufacturing plants; methods and
practice] Planirovanie sebestoimosti na mashinostroitel'nom
zavode; metodika i praktika. Moskva, Gos.nauchno-tekhn.izd-vo
mashinostroit.lit-ry, 1959. 249 p. (MIRA 12:4)
(Machinery industry--Costs)

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S/028/60/000/02/022/024
D041/D002

AUTHOR: Frolov, Ye.S.

TITLE: Conference on Complete Normalization of the Production Process Elements

PERIODICAL: Standartizatsiya, 1960, Nr 2, pp 59 - 60 (USSR)

ABSTRACT: Information is given on a conference convened in December 1959 by the Moskovskiy dom nauchno-tekhnicheskoy propagandy im.F.E. Dzerzhinskogo (Moscow House of Scientific-Technical Propaganda imeni F.E. Dzerzhinskiv) and the Nauchno-issledovatel'skiy institut tekhnologii i organizatsii proizvodstva (Scientific Research Institute of Technology and Production Organization). Delegates from about 150 plants, institutes and design offices were present. Professor V.V. Boytsov stated in his report "Normalization4Bases of Mechani-

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Conference on Complete Normalization of the Production Process
Elements

zation and ¹⁴Automation of Production Processes" that small-series production works are very little mechanized and automated. The new trend of automation is by means of special machines and automatic lines with extensive use of exchangeable units.¹⁴ After an analysis of parts classification and operations, it can be assumed that about 40% of machine tools of plants with small-series production output can be fitted with special cutting equipment, and up to 90% of all equipment elements can be normalized in the machine-tool industry. There are 72 unit-head machine tools at a plant, they brought about an annual economy of 2300 thousand rubles. Many of them were assembled in a few weeks. They may be easily taken apart and the unit heads rearranged into different combinations. The idea suits other equip-

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ment, and plants will be able to mechanize and automate their equipment on their own. Engineer M.I.

Dobromyslin, in his report on the basic principles of "agregatirovaniye" (unit-heads) of machine tools said that types of unit-heads are normalized, and unit-heads for machines and lines must be standardized. Engineer I.Ya. Serdyukov spoke on experience with the use of such machine tools, mentioning that the "AS-19" unit-head machine cut down to 3.7 hours the former 10.6 hours required for machining a casing; 65 unit-head machine tools assembled at a plant gave 2308 thousand rubles annual economy. Zavod im. Vladimira Il'yicha (Imeni Vladimir Il'yich Plant) and Moskovskiy karbyuratornyy zavod (Moscow Carburetor Plant) have acquired experience in combining the unit-head machine tools. Engineer V.V.

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Kuz'min reported on the basic trends and methods of the normalization of auxiliary equipment. Engineer Sh.G. Rubin spoke of normalization of the electric equipment elements and the possibilities of automatic and semi-automatic welding with frequently changing work. Engineer A.Z. Ramm reported on unification of foundry equipment, ingot molds and technological casting process elements for large aluminum castings, saying that some plants and institutes are now designing and using large ingot molds and casting machines without any normalization or unification of the major and auxiliary equipment, which considerably reduces the economical gain. Candidate of Technical Science V.V. D'yachenko spoke on typization and normalization of welding technology and the importance of special welding equipment consisting of nor-

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malized component units. Engineer Bryskin-Iyamin discussed the problems of normalization of special auxiliary foundry equipment and major foundry equipment elements. Candidate of Technical Science V.A. Leonov spoke on the normalization problems for work processes and major and auxiliary equipment of blank-stamping shops. Engineer I.G. Naydov reported on technical and economic effects of overall normalization of all elements of technological processes. The conference approved the new trends and marked measures for practical application.

Card 5/5

FROLOV, Ye. S. Cand Tech Sci -- (diss) "Study of the ^{performance} ~~function~~ of
~~the~~ two-cycle piston vacuum pump." Mos, 1958. 10 pp (Min of Higher
Education USSR. Mos Order of Lenin and Order of Labor Red Banner Higher
Tech School im N. E. Bauman), 150 copies (KL, 52-58, 103)

FROLOV, Y. S.

14(1)

PHASE I BOOK EXPLOITATION

SOV/2472

Vsesoyuznyy nauchno-issledovatel'skiy i konstruktorskiy institut khimicheskogo mashinostroyeniya

Konstruirovaniye i issledovaniye kompressorov i vakuum-nasosov (Design and Investigation of Compressors and Vacuum Pumps) Moscow, Mashgiz, 1958.
90 p. (Series: Its: Sbornik statey, 22) 5,000 copies printed.

Ed.: V.A. Rumyantsev, Engineer; Ed. of Publishing House: A.M. Monastyrskaya;
Tech. Ed.: A.F. Uvarova; Managing Ed. for Literature on Machine Building and Instrument Construction (Mashgiz): V.V. Pokrovskiy, Engineer.

PURPOSE: This collection of articles is intended for scientists and engineers working in the field of compressor manufacture, and also for students of vuzes specializing in compressors and vacuum pumps.

COVERAGE: The booklet consists of five articles. The first article presents investigation results and design data for determining resistances in strip-type automatic diaphragm valves. The second articles presents for the first time results of the investigation of large diameter diaphragms used in diaphragm-type compressors. The third article presents, also for the first time, experimental results and methods for designing metallic packings for piston-compressor

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Design and Investigation of Compressors (Cont.)

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rods. The fourth article presents test results and theoretical data for designing two-stage piston vacuum pumps. The last article presents data on designing diffusion-type oil vacuum pumps. No personalities are mentioned. References follow each article.

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Frolov, Ye.S., Engineer; and V.D. Lubenets, Candidate of Technical Sciences, Volumetric and Power Characteristics of a Two-stage Vacuum Pump With a Slide-Valve Gear	
Pomerantsev, A.A., Professor, Doctor of Physical and Mathematical Sciences and K.P. Shumskiy, Candidate of Physical and Mathematical Sciences. The Theory of High-vacuum Steam-Injector Pump Nozzles	81

AVAILABLE: Library of Congress

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GO/gmp
11-24-59

PROLOV, Ye.S., inzh.; LUBINETS, V.D., kand. tekhn. nauk.

Volume and energy characteristics of double-stage vacuum pumps
with valve distribution. Sbor. st. NIIKHIMMASH no.22:65-80 '58.
(Vacuum pumps) (MIRA 11:6)

FROLOV, Ye.S., kand.tekhn.nauk

Slip coefficient for two-stage piston vacuum pumps. Izv.vys.
ucheb.zav.; mashinostr. no.4:20-24 '59. (MIRA 13:4)

1. Moskovskoye vyssheye tekhnicheskoye uchilishche im.Baumana.
(Vacuum pump)

LUBENETS, V.D., kand.tekhn.nauk, dots.; FROLOV, Ye.S., kand.tekhn.nauk;
VASIL'YEV, V.I., inzh.; VLASOV, V.M., inzh.; ZAKHAROV, B.D., inzh.

Investigating the performance of the VN-120 vacuum-pump. Izv.vys.
Ucheb.zav.; mashinostr. no.4:166-171 '59. (MIRA 13:4)

1.Moskovskoye vyssheye tekhnicheskoye uchilishche im. Baumana.
(Vacuum pumps)

AUTHOR: ~~Frolov, E.S.~~ ^V Engineer

SOV/122-59-3-5/42

TITLE: On the Design of Two-Stage Vacuum Piston Pumps (O konstruirovani dvukhstupenchatykh porshnevykh vakuum-nasosov)

PERIODICAL: Vestnik Mashinostroyeniya, 1959, Nr 3, pp 20-23 (USSR)

ABSTRACT: An investigation carried out at the Moscow Technical University (MVTU) Imeni Bauman is reported, whose object was the determination of the minimum permissible ratio of the swept volumes of the first and second stages in a vacuum pump and the effect of the volume of the inter-stage container on this ratio and on the behaviour of the pump. Changing the volume ratio was accomplished by varying the speed of the second stage. An additional test was carried out with the second-stage volume reduced by a pressed-in cylinder liner. The cross-section of the stage is shown in Fig 1. The swept volume ratio was varied between 1.0 and 0.1. Fig 2 is a plot of the volumetric output against the vacuum achieved at different stage volume ratios. Fig 3 shows the intermediate pressure as a function of the same ratio together with the achieved vacuum and illustrates the negligible

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SOV/122-59-3-5/42

On the Design of Two-Stage Vacuum Piston Pumps

effect of the intermediate on the final pressure vacuum. Fig 4 shows the intermediate pressure as a function of the final vacuum for different stage volume ratios. Fig 5 illustrates the same dependence carried to much higher final pressures. A reduction in the stage volume ratio leads to a more even distribution of pressure ratios by stages and thus reduces the overall power consumed. The recommended ratio is 0.15 to 0.2. The volumetric output lost thereby (4-10%) can be restored by increasing the mean piston speed of the second stage up to 3-4 m/sec. This is stated to raise the output by a factor of 3. A two-stage pump so designed under the direction of Lubents, V.D., Candidate of Technical Sciences, Lecturer, based on the vacuum pump of the Shebekino Mach.-Building Works (Shebekinskiy Mashinostroitel'nyy Zavod) is illustrated in cross-section in

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SOV/122-59-3-5/42

On the Design of Two-Stage Vacuum Piston Pumps

Fig 6. In this design the second stage acts as the control (spool) valve for the first stage.
There are 6 figures and 3 Soviet references.

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SOV/122-59-3-36/42

AUTHOR: Frolov, Ye. S.

TITLE: Investigation of the Operation of a Two-Stage Vacuum
Piston Pump (Issledovaniye raboty dvukhstupenchatogo
porshnevogo ~~vakuum~~-nasosa)

PERIODICAL: Vestnik Mashinostroyeniya, 1959⁵⁹, Nr 3, p 87 (USSR)

ABSTRACT: Author's summary of a dissertation submitted to the
Moscow Technical University (Moskovskoye Vyssheye
Tekhnicheskoye Uchilishche. Ordena Lenina I Ordena
Trudovogo Krasnogo Znameni. Imeni Bauman) for the
attainment of the Degree of Candidate of Technical
Sciences. On the basis of experimental work, the
volumetric and power properties of the vacuum pump have
been established; the coefficients which characterise
the pump operation have been formulated. The components
of the coefficient of evacuation and the relationship
between the volumes of the two stages, appropriate in
practice, have also been found. The effect of the

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SOV/122-59-3-36/42

Investigation of the Operation of a Two-Stage Vacuum Piston Pump

mean piston speed, the cross-sectional area of the cylinder ports and the effect of the angular range of port opening on the output and degree of evacuation produced by the pump have been established.

Card 2/2

KOZLOV, V., inzh.; FROLOV, Ye., kand.tekhn.nauk

Measurement of the temperature of a working body in the cylinder
of a heat engine. Khol.tekh. 37 no.4:9-13 J1-Ag '60.

(MIRA 13:11)

1. Moskovskoye vyssheye tekhnicheskoye uchilishche im. N.E.Baumana.
(Compressors) (Temperature--Measurement)

ZEDGINIDZE, G.P.; FROLOV, Ye.S., kand. tekhn. nauk, retsenzent;
STROGANOV, L.P., inzh., red.; DEMKINA, N.F., tekhn. red.

[Measuring the temperature of rotating machine parts] Iz-
merenie temperatury vrashchaiushchikhsia detalei mashin.
Moskva, Mashgiz, 1962. 270 p. (MIRA 15:10)
(Thermometry)

GOLOVINTSOV, A.G., doktor tekhn.red. prof. [deceased]; RUMYANTSEV, V.A., dots.; AIDASHEV, V.I.; PESHTI, Yu.V.; PLASTININ, P.I.; SUSLOV, A.D.; FROLOV, Ye.S.; YAMINSKIY, V.V.; STRAKHOVICH, K.I., doktor tekhn.nauk, prof., retsenzent; PALEYEV, N.M., inzh., red.

[Rotary compressors] Rotatsionnye kompressory. [By] A.G. Golovintsov i dr. Moskva, Izd-vo "Mashinostroenie," 1964.
314 p. (MIRA 17:7)

1. Fakul'tet teplovykh i gidravlicheskiykh mashin Moskovskogo v'sshnego tekhnicheskogo uchilishcha imeni N.Ye. Bauman
(for all except Strakhovich, Paleyev).

KATSIGRAS, G.; SERGEYEV, A.; FROLOV, Yu.

Improving the repairing of oil pumps. Avt.transp. 4C no.4:
25-27 Ap '62. (MIRA 15:4)
(Oil hydraulic machinery--Maintenance and repair)

GRAMENITSKIY, V.N.; FROLOV, Yu.A.; KHANSUVAROV, K.I.

Grade 0,02 standard manometer with measurement limits from
0 to 2,5 kgf/cm². Izm.tekh. no.19:19-20 N '61.

(MIRA 14:11)

(Manometer)

ANASTASIYEV, Petr Ivanovich; ZELENETSKIY, Mikhail Mikhaylovich;
FROLOV, Yuriy Aleksandrovich; KRASOVSKIY, K.P., red.; BUL'DYAYEV,
N.A., tekhn. red.

[Overhead electric power distribution lines of industrial enterprises] Vozdushnye linii elektroperedachi promyshlennykh predpriyatii. Moskva, Gosenergoizdat, 1962. 279 p. (MIRA 15:12)
(Electric power distribution) (Electric lines--Overhead)

ANASTASIYEV, Petr Ivanovich; ~~PROLOV, Yuriy Aleksandrovich~~;
KAMINSKIY, Ye.A., red.; FRIDKIN, L.M., tekhn. red.

[Overhead power transmission lines with carrying capacity
up to 1000 volts] Nadushnye linii do 1000 v. Moskva, Gos-
energoizdat, 1963. 87 p. (Biblioteka elektromontera, no.87)
(MIRA 16:5)

(Electric lines--Overhead)

ANASTASIYEV, Petr Ivanovich; FROLOV, Yuriy Aleksandrovich;
KARSAULIDZE, A.N., red.

[Construction and erection of 3-10 kv. lines; construction operations] Sooruzhenie i montazh lini 3-10 kv; stroitel'nye raboty. Moskva, Energiia, 1964. 46 p. (Biblioteka elektromontera, no.131) (MIRA 17:9)

ZVENIGORODSKIY, Iosif Solomonovich; FROLOV, Yuriy Aleksandrovich;
KAYETANOVICH, M.M., red.

[Steel wires and busbars in electrical networks with
ratings up to 1,000 volts] Stal'nye provoda i shiny v
elektricheskikh setiakh do 1 000 v. Moskva, Izd-vo
"Energia," 1964. 55 p. (Biblioteka elektromontera,
no.125) (MIRA 17:6)

ANASTASIYEV, Petr Ivanovich; FROLOV, Yuriy Aleksandrovich;
KARSAULIDZE, A.N., red.

[Construction and erection of 3-10 kv. power transmission
lines; erection operations] Soorushenie i montazh lini
3-10 kv; montazhnye raboty. Moskva, Energiia, 1965. 47 p.
(Biblioteka elektromontera, no.155) (MIRA 18:6)

FROLOV, Yu.F.

The DSP-80 electric-arc steel furnace with an 80-ton capacity.
Biul.tekh.-ekon.inform. no.11:8-10 '59. (MIRA 13:4)
(Electric furnaces)

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AUTHORS:

Yegorov, G. F., Fonin, V. V., Prolov, Yu. G., Yegodin, G. A.

TITLE:

Solvate Forms of Zirconium- and Hafnium Nitrates With Tri-
butyl Phosphate

PERIODICAL:

Zhurnal neorganicheskoy khimii, 1960, Vol. 5, No. 5,
pp. 1044-1050

TEXT: In the introduction, the authors mention in brief the problems dealt with: preparation of zirconium with a minimum hafnium content, investigation of the mechanism of the $(C_4H_9O)_3PO$ (TBP) extraction, investigation of the solvate form. Next, they describe the purification of the reagents. The partition coefficients of Zr and Hf were determined by means of Zr^{95} and Hf^{181} . The resultant Nb^{95} was separated from Zr^{95} by means of MnO_2 . The extractions were carried out at 20° and at a zirconium- and hafnium concentration of 10^{-5} moles/l. First of all, the extraction of nitric acid by tributyl phosphate (TBP) at different acidity and concentration of the NO_3^-

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Solvate Forms of Zirconium- and Hafnium
Nitrates With Tributyl Phosphate

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ions was investigated. In this connection, the authors refer to papers by A. S. Solovkin (Ref. 2), A. M. Rozen (Ref. 6), V. V. Pomin, and Ye. P. Mayorova (Refs. 3,4,7). The existence of the complexes $\text{TBP} \cdot \text{HNO}_3$ and $\text{TBP} \cdot 2\text{HNO}_3$ assumed by the last-mentioned authors in Ref. 7, and the values of their instability constants (0.22 and 0.00044) were confirmed experimentally (Table 1). Xylene was used as the solvent for TBP. The dependence of the nitric-acid extraction on the concentration of hydrogen ions and in the presence of NaNO_3 , NH_4NO_3 , LiNO_3 or $\text{Hc}(\text{NO}_3)_2$ is shown in table 2. The mechanism assumed of HNO_3 extraction holds in a wide range also in the presence of an excess of NO_3^- ions. It is proved for the extraction of Zr and Hf that the partition coefficients α are proportional to the concentration of free TBP in the organic phase. The number of solvating TBP molecules was determined from the dependence of $\log \alpha$ on $\log(\text{TBP})_{\text{org}}$. Experimental data for zirconium are presented in table 3, for hafnium in table 4. It resulted that partition coefficients of Zr and Hf increased with increasing TBP con-

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Solvate Forms of Zirconium- and Hafnium
Nitrates With Tributyl Phosphate

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centration in the organic phase. On the basis of the diagram $\log \alpha$, $\log(\text{TBP})$ (Fig. 1), the formation of the solvate $\text{M}(\text{NO}_3)_4 \cdot \text{TBP}$ results, for low TBP concentrations and the solvate $\text{M}(\text{NO}_3)_4 \cdot 2\text{TBP}$ for higher TBP concentrations. At HNO_3 concentrations of 5 moles/l the formation of more complicated complexes is assumed, which, however, was not further investigated. Figs. 2,3 depict the dependence of the partition coefficients of Zr and Hf on the hydrogen-ion concentration and the concentration of the added nitrates. The α -values decrease with decreasing hydrogen-ion concentration. This decrease, however, depends on the type of the added nitrate. In the presence of NH_4^+ and Na^+ , bivalent ions, ZrO^{2+} , or $\text{Zr}(\text{OH})_2^{2+}$ are dissolved. The deviation of the dependence of α from linearity in the presence of Li^+ and Mg^{2+} is explained by a stronger hydration of these ions. There are 3 figures, 4 tables, and 7 references, 6 of which are Soviet.

SUBMITTED: February 4, 1959

Card 1/1

FROLOV, Yu.G.; OCHKIN, A.V.

Problems involved in the mechanism of extraction. Zhur.neorg.-
khim. 7 no.6:1486-1489 Je '62. (MIRA 15:6)
(Extraction (Chemistry))

FROLOV, Yu.G.

Mechanism of the extraction of acids and the basicity of
extraction agents. Trudy MKHTI no.43:5-8 '63. (MIRA 17:10)

SUDARSKIN, B.N.; FROMAN, YU.S.; GILMAN, A.A.; KILBING, V.A.; KILBING, V.A.

Some extraction properties of α -methylvalerolactone. (May 1961) 10-11
9-11 1961. HWA 1010

9-11 '67.

SUDARIKOV, B.N.; FROLOV, Yu.G.; IL'ICHEV, V.A.; PUSHKOV, A.A.; TAKHAROV-
NARTSISSOV, O.I.; OCHKIN, A.V.

Physicochemical properties of some n-aliphatic amines. Trudy
MKINTI no.43:21-28 '63.

(MIRA 17:10)

FROLOV, Yu.G.; SERGIYEVSKIY, V.V.

Reaction of sulfuric acid with tri-n-octylamine in organic solvents. Trudy MINTI no.43:58-63 '63.

(MIRA 17:10)

ZVYAGINTSEV, O.Ye.; FROLOV, Yu.G.; SUDARIKOV, B.H.

Mechanism of the extraction of tetra- and hexavalent uranium
sulfates by tri- and di-n-octylamines. Trudy NIKHTI no.47:134-
139 '64. (MIRA 18:9)

FROLOV, Yu.G.; SERGIYEVSKIY, V.V.

Effect of n-octyl alcohol on the extraction of sulfuric acid
with tri n-octylamine. Zhur. neorg. khim. 10 no.3:697-702
Mr '65. (MIRA 18:7)

ZVYAGINTSEV, O.Ya.; FROLOV, Yu.G.; CHEN' TSZAN' L' BAN; VAL' KOV, A.V.

Extraction of sulfuric acid and uranyl sulfate with N-alkylanilines.
Zhur.neorg.khim. 10 no.4:981-985 Ap '65. (MIRA 18:6)

ZVYAGINTSEV, O.Ye.; FROLOV, Yu.G.; PUSHKOV, A.A.; LUSHCH, B.

Extraction of inorganic acids by aniline derivatives. Zhur.
neorg. khim. 10 no.2:512-517 F '65. (MIRA 18:11)

1. Submitted Sept. 16, 1963.

FALABINA, A.V.; TYUKAVKINA, N.A.; YASHINA, O.G.; MAKHNO, I.P.; FROLOV, Yu.L.

Synthesis and properties of vinyl ethers of some higher phenols.
Izv.vys.ucheb.zav.;khim.i khim.tekh. 4 no.4:626-631 '61.

(MIRA 15:1)

1. Irkutskiy gosudarstvennyy universitet imeni Zhdanova, kafedra
vysokomolekulyarnykh soyedineniy i organicheskogo sinteza.
(Phenols) (Ethers)

FROLOV, Yu.L.; FILIPPOVA, A.Kh.; KALABINA, A.V.; POGODAYEVA, L.K.;
TYUKAVKINA, N.A.

Physical studies in the area of unsaturated aryl ethers and their
derivatives. Part 1: Spectra of vinyl substitutes ether of phenol.
Zhur.strukt.khim. 3 no.6:676-679 '62. (MIRA 15:12)

1. Irkutskiy gosudarstvennyy universitet.
(Phenol) (Ethers--Spectra)

KALABINA, A.V.; DUBINSKAYA, E.I.; FILIPPOVA, A.Kh.; FROLOV, Yu.L.;
RATOVSKIY, G.V.

Synthesis of vinyl ethers of nitro- and halonitrophenols. Izv.
vys.ucheb.zav.; khim. i khim.tekh. 7 no.2:232-236 '64.

(MIRA 18:4)

1. Irkutskiy gosudarstvennyy universitet im. A.A.Zhdanova,
kafedra vysokomolekulyarnykh soyedineniy.

MAKSYUTIN, Yu.K.; FROLOV, Yu.L.; KALABINA, A.V.; SHEVELEVA, V.A.

Hydrogen bonding between phenols and vinyl and aryl ethers.
Zhur.fiz.khim. 38 no.11:2604-2607 N 14. (MIRA 18:2)

1. Irkutskiy gosudarstvennyy universitet imeni Zhdanova.

FROLOV, Yu.L.; KALABINA, A.V.; FILIPPOVA, A.Kh.

Physical studies of unsaturated aryl ethers and their derivatives.
Part 2: Capacity of an oxygen atom of transmitting electron effects.
Zhur. struk. khim. 6 no.3:397-401 My-Je '65.

(MIRA 18:8)

1. Irkutskiy gosudarstvennyy universitet imeni A.A.Zhdanov.

FRONOV, Yu.I.

Calculating the π -electron structure of certain simple vinyl
ethers by the semiempirical method of a self-consistent MO-LCAO
Field. Izv. vys. ucheb. zav.; fiz. 8 no.3:177-179 '65.

(MIRA 18:9)

1. Irkutskiy gosudarstvennyy universitet imeni L.S. Zhdanova.

FROLOV, Yu.M., inzh.

How method of installing grounding circuits. Mont. i spets.
rab. v stroi. 24 no.7:23-24 J1 '62. (MIRA 15:6)

1. Vsesoyuznyy trest po elektrifikatsii promyshlennykh
predpriyatiy tsentral'nykh rayonov SSSR.
(Electric currents--Grounding)

FROLOV, Yu.M., inzh.; MATSNEV, L.M., inzh.

Hand welding of aluminum box-shaped busducts. Mont. i spets. rab. v
stroi. 25 no.3:15-16 Mr '63. (MIRA 16:2)

1. Vsesoyuznyy trest po elektrifikatsii promyshlennykh predpriyatiy
tsentral'nykh rayonov SSSR.

(Bus conductors (Electricity)—Welding)

~~I-10258-66~~ EWT(d)/EWT(m)/EWP(c)/EWP(v)/T/EWP(t)/EWP(k)/EWP(h)/EWP(b)/EWP(l)/EWA(c)
 ACC NR: AP5026766 JD/HM SOURCE CODE: UR/0286/65/000/017/0048/0048

INVENTOR: Roshchin, V. V.; Grinenko, V. I.; Gusakov, G. I.; Frolov, Yu. M.; Novikov, V. I.; Turkov, I. I.

ORG: none

TITLE: Method of automatic TIG welding of fixed tube joints. Class 21, No. 174299

SOURCE: Byulleten' izobreteniy i tovarnykh znakov, no. 17, 1965, 48

TOPIC TAGS: welding, metal welding, TIG welding, automatic welding, *pipe*

ABSTRACT: This Author Certificate introduces a method of automatic TIG welding of fixed joints of pipes of any thickness. The welding is done with the electrode vibrating across the groove according to a program determined by the torch motion. Filler wire is fed at the moment when the electrode crosses it. A modified method, in which the direction of welding is reversed after each pass in accordance with the program and the filler wire is fed correspondingly from two sides, is mentioned. [MS]

SUB CODE: 13/ SUBM DATE: 13May64/ ATD PRESS: *4160*

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C111/C222

AUTHOR: Frolov, Yu.N.

TITLE: On Non-Homogeneous Equations of Infinite Order in a Generalized Derivative

PERIODICAL: Vestnik Moskovskogo universiteta. Seriya I matematika, mekhanika, 1960, No.4, pp.3-13

TEXT: Let

$$(2) \quad f(z) = \sum_{k=0}^{\infty} a_k z^k, \quad a_k \neq 0 \quad (k=0,1,2,\dots)$$

be an entire function of the order ρ and of the type $S \neq 0, \infty$. Let exist

$$(3) \quad \lim_{k \rightarrow \infty} k^{1/2} \sqrt{|a_k|} = (Se^3)^{1/2}.$$

Let $F(z) = \sum_{k=0}^{\infty} b_k z^k$ be an arbitrary function regular in $|z| < R, \infty$. Let the generalized derivative

$$(4) \quad D^n F = D^n(F, f) = \sum_{k=n}^{\infty} b_k \frac{a_{k-n}}{a_k} z^{k-n}$$

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On Non-Homogeneous Equations of Infinite Order in a Generalized Derivative

be also regular in $|z| < R$. Let further $\phi(t) = \sum_{k=0}^{\infty} c_k t^k$ be an integral sum of the order ρ and finite type σ_1 . The author considers the equation

$$(7) \quad M(F) = \phi(z),$$

where the operator $M(F)$ is defined by

$$(5) \quad M(F) = \sum_{k=0}^{\infty} a_k D^k F.$$

Lemma: If $\varphi(z)$ is an entire function of the order ρ and of the type σ_1 , $\varepsilon > 0$ and arbitrary, $\mu > 0$ and fixed, then for a sufficiently large r there exists a circle within the annulus $r \leq |z| \leq (1+\mu)r$ on which

$$(8) \quad \ln |\varphi(z)| > -H(\mu)(\sigma_1 + \varepsilon)|z|^3,$$

where

$$H(\mu) = \left[2 + \ln \frac{8e(1+\mu)}{\mu} \right] [2e(1+\mu)]^3, \quad |z| \geq r > r_0(\varepsilon).$$

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On Non-Homogeneous Equations of Infinite Order in a Generalized Derivative

Theorem 1: Let $\delta > 0$ be arbitrary, fixed and $\phi(z) = \sum_{k=0}^{\infty} a_k z^k$ be a function regular in the circle

$$|z| < r(r) = \frac{e^{\frac{(1+\delta)^2}{\delta}}}{1+\delta} \left[\frac{\mu^2(r) + \frac{\sigma_1 H}{\delta}}{e} \right]^{1/2},$$

where $r > 0$, $H = \left[2 + \ln \frac{8e(1+\delta)}{\delta} \right]$, $[2e(1+\delta)]^2$, $\mu(r) = \left(r^2 + \frac{\sigma_1}{\delta} \right)^{1/2}$. Then for every $r_1 < r$ there exists a particular solution of

(11) $M(F) = \phi(z)$
being regular in $|z| < r_1$.

Theorem 2: If $\phi(z) = \sum_{k=0}^{\infty} a_k z^k$ is an entire function, then there exists a solution of (11) being entire too.

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